DOCUMENT RESUME

ED 146 380 08 CE 013 251

AUTHOR Bowlsbey, JoAnn H.; And Others
TITLE DISCOVER: A Computer-Based Career Guidance & Counselor-Administrative Support System. Field Trial Report.
INSTITUTION DISCOVER Foundation, Inc., Westminster, Md.
SPONS AGENCY Illinois State Office of Education, Springfield. Div. of Vocational and Technical Education.; International Business Machines Corp., Poughkeepsie, N.Y.; Office of Education (DHEW), Washington, D.C.
PUB DATE 76
NOTE 80p.; For related documents see CE 013 250 and ED 136 055; Best copy available

EDRS PRICE MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS Attitudes; Career Education; Computer Assisted Instruction; *Computer Oriented Programs; Decision Making; Elementary Secondary Education; Guidance Services; *Information Systems; *Occupational Guidance; Parent Attitudes; *Program Effectiveness; Program Evaluation; Questionnaires; Student Attitudes; *Vocational Development
IDENTIFIERS DISCOVER

ABSTRACT

A comprehensive report of the last six weeks of a three-month field trial of DISCOVER, conducted in one junior high and one senior high school in Baltimore, Maryland, and interpretation of the collected data are provided in this report. (DISCOVER, the product of four years of development, 1972-76, is a computer-based guidance system which includes twelve modules of interactive content.) Evaluative findings cover the assessment of student and parent reactions to DISCOVER and the effects of the use of DISCOVER on students, using the Assessment of Career Development (ACD) and the Career Development Inventory (CDI) instruments, four questionnaires, and one interview schedule. Some of the major findings presented follow: (1) Students seemed to have moved toward an increased specification of their educational plans as a result of using DISCOVER; (2) DISCOVER received a favorable overall response from both students and parents; and (3) no significant differences between the experimental and control groups for either high school or junior high school students on any of the scales of the ACD or CDI were found. Discussion of results also includes generalizable findings regarding the computer-assisted delivery system. Appendixes comprise approximately one-half of the document and include a descriptive brochure, student questionnaires, interview questions, cover letter and questionnaire sent to parents, and tabulated response data for questionnaires. (TA)

Documents acquired by ERIC include many informal unpublished materials not available from other sources. ERIC makes every effort to obtain the best copy available. Nevertheless, items of marginal reproducibility are often encountered and this affects the quality of the microfiche and hardcopy reproductions ERIC makes available via the ERIC Document Reproduction Service (EDRS). EDRS is not responsible for the quality of the original document. Reproductions supplied by EDRS are the best that can be made from the original.

ED146380

# A Computer-Based Career Guidance & Counselor-Administrative Support System

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Jack Rayman

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND THE ERIC SYSTEM CONTRACTORS."

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

CE 013 251

## Field Trial Report

DISCOVER

# FIELD TRIAL REPORT

August 1, 1976

JoAnn H. Bowlsbey

Jack R. Rayman

Doris L. Bryson

COPYRIGHT ©
DISCOVER FOUNDATION,
INC. 1976

Table of Contents

INTRODUCTION.....1

Review of Existing Systems.....3

DISCOVER, the Latest of the Computer-Based Systems.....5

Field Trial Conditions.....5

Research Questions.....7

Organization of the Report.....8

METHOD.....9

Subjects.....9

Apparatus.....11

Procedure.....12

Instrumentation.....13

Analysis of Data.....15

RESULTS.....16

Student Questionnaire Responses.....16

Parent Questionnaire Responses.....19

Evidence of System Effects.....21

DISCUSSION.....24

References.....30

## I. Introduction

Computers have been used in guidance for approximately one decade. During this time developers of computer-based guidance systems have been facing some very critical first-level questions. Some of these are:

1. Which guidance tasks can be performed by a computer, and which of these tasks should be reserved for counselor attention?
2. Is it ethical for a machine to assist a student with career decision making?
3. Should a computer-based guidance system be modeled after what counselors do when performing the same functions, or does the computer have unique capabilities which could be applied to perform the same tasks in a different way?
4. How can computer-based systems be maximally integrated into a total guidance program?
5. What hardware and software capabilities can schools currently afford? Can they afford cathode ray tubes as opposed to typewriter terminals; or even cathode ray tubes with complementary visuals? Can schools afford natural language capability as opposed to selection of multiple-choice items? Will they pay for computer-assisted instruction in career guidance content areas, or only for information retrieval and search strategy functions?
6. Should career guidance systems be developed as "stand-alone" systems which require a computer dedicated for this purpose alone, or should they be developed for placement in a computer which is also performing a host of other administrative and/or instructional tasks?
7. Should user records be stored in the computer so that personal information can be used in conjunction with the information and experiences provided by the system?

8. Is it possible to create a data collection method which will provide sufficient, recent, and accurate data and which can be used by all developers alike?
9. How can the immense technical problems involved in such systems be surmounted, and how can "counselor-type" people learn to communicate with data processing specialists?

These are just a few of the issues which have been faced for the first time in the past ten years. In any pioneer effort where such base-line questions are still fresh and unanswered, and especially where funds have been precarious and inadequate, it is to be expected that neither research questions nor research answers are clear and definitive. Every developer of these early guidance systems has attempted to measure the effectiveness of his or her work. After the tired developer finally wins or survives the battles of grappling with what the system should do and how it should do it, which of a mass of possible hardware and software configurations to get locked into, where to get the money to finance the development, where to get employees who can be trained for a virgin field, and how to get the system technically operational on schedule, he or she must then face the hard research questions. The two most difficult questions are, "What shall we measure?" and "What yardsticks shall we use for measurement?" The "whats" to measure might be cognitive occupational knowledge, short-term occupational choice, long-term occupational satisfaction, decision-making skill, self-knowledge, or vocational maturity, as a possible beginning list. The "what to measure with" problem leads the researcher to look at all existing instruments which measure occupational knowledge, self-knowledge, degree of specification of career plans, decision-making skill, and vocational knowledge and, in so doing, to find that all of the measures are new and experimental and that they do not relate directly to the content of the system which has been developed. The researcher then turns

to other valid research techniques such as observation, questionnaires, and interviews and collects a wealth of such data, but struggles with guilt feelings because of the failure to meet the expectation to produce "hard data."

## Review of Existing Systems

In the past decade approximately ten on-line, direct-inquiry computer-based career guidance systems have been developed. Broadly defined, these are systems in which the user communicated directly with the computer's prestored text and files by means of a typewriter or visual display screen terminal for the purpose of receiving vocational and educational information designed to assist with personal career decision making. Each of the systems developed has had major differences in terms of the proposed conceptual design, the comprehensiveness of objectives, the amount of content, the hardware and software configuration used, the capabilities of the computer used, the cost per hour at the terminal, and the purpose for development of the system. It is not the intent of this document to delineate these differences, but rather to summarize the evaluative findings which have come out of the field trial and operational use of these systems. These findings can most easily be summarized in a series of statements:

1. Students accept computer-based guidance systems with enthusiasm and do not feel dehumanized by them. (Chapman, et. al., 1973, Harris, 1972; Myers, et. al., 1971; Impelleteri, 1968) When provided with alternative ways to obtain vocational information, students will choose to use a computer system over books, audio-visual aids, and other traditional sources.

2. Parents accept computer-based systems with enthusiasm, reporting an increase in home conversation and involvement with career planning as a result of the student's use of such a system. (Thompson, et. al., 1971)

3. As a result of the use of computer-based systems, students report the following: (Chapman, et. al., 1973; Harris, 1972; Myers, et. al., 1971; Impelleteri, 1968)

   a. increased awareness of the world of work;

   b. increased awareness of the relationship of self-characteristics (interests, aptitudes, values) to occupational choices;

   c. expansion of the number of vocational options being considered;

   d. greater ability to make vocational and educational decisions;

   e. increase in general occupational knowledge and in knowledge specific to the occupations or institutions reviewed at the terminal;

   f. engaging in exploratory behavior after use of the system such as reading; talking to counselors, parents, teachers, or workers in a given occupation; and sending away for additional material;

   g. receiving confirmation of career plans already made;

   h. receiving assistance with crystallizing career plans, if these were in a state of uncertainty;

   i. finding most of the information desired about occupations;

   j. finding the computer a "fun" experience which they would recommend to a friend.

4. Relatively short use (2-4 hours) of a computer-based system causes a statistically-significant increase in certain components (Awareness of Need to Plan and Knowledge and Use of Resources) of vocational maturity, as measured by the Career Development Inventory (Super, et al., 1971) in two studies (Harris, 1972; Myers, et. al., 1971).

5. Use of a computer-based system for collection of information about occupations causes a significant increase in cognitive occupational knowledge (Maola, 1974) as measured by three subscales on the Assessment of Career Development (American College Testing Program, 1973).

6. The computer alone as a delivery system is as effective as the counselor alone in two areas which have been studied, namely selection of courses for the next year in high school (Price, 1971) and provision of vocational guidance assistance to high-ability sophomores (Melhus, 1971). There is evidence, however, that combined use of counselor and computer for delivery of a guidance program has the highest potential for effecting maximum gain (Myers, et. al., 1972; Melhus, 1971).

## DISCOVER, the Latest of the Computer-Based Systems

At the time of this writing, approximately seven computer-based guidance systems operate in schools, colleges and agencies in the United States. Most of what is known about the effectiveness of these systems has been summarized in the preceding section. DISCOVER, the latest of the computer-based systems, has now made its entrance into this environment. DISCOVER is a sophisticated guidance treatment, consisting of 21 modules of content, which are described in Appendix A. The DISCOVER system is the product of four years of development, from 1972-1976, which has been supported by the Illinois Division of Vocational and Technical Education, the United States Office of Education (Vocational Education, Part C), and the IBM Corporation, and is intended for use by secondary-level students, grades 7-12. Just prior to the time of completion of the system, a 3-month field trial was conducted in two sites, one junior high and one senior high, in Baltimore, Maryland. The primary purpose of this document is to provide a comprehensive report of the last six weeks of this field trial, reporting and attempting to interpret the data which were collected.

## Field Trial Conditions

It is important for the reader of this report to understand the conditions under which the field trial was conducted. As is always the case with field

research, it is impossible to assess the extent to which any one of these variables or the interaction of variables affected the data reported; however, these conditions must be kept in mind as data are read and interpreted:

1. The DISCOVER programs were placed in a large computer owned by the Baltimore Public School System. The programs ran simultaneously with all of the regularly scheduled operations of that computer, a situation which caused a heavy load on the total system. Effects of this condition were that the DISCOVER staff had very little control over the machine operation or over the priority which DISCOVER had in the system. Students often experienced very long wait times at the terminal, often in excess of 20 seconds. Students also experienced the frustration of coming for an appointment only to find that the system was not operational at all for a broad variety of reasons.

2. The sample sizes reported are extremely small. Two factors caused this situation: a) the field trial began one month later than planned due to a host of technical and people problems; b) to alleviate the heavy load on the computer and the resultant long response times, the Project staff and the data processing staff agreed to shut DISCOVER down from 11:00 to 12:45 daily. This plan made it necessary to cut the sample size approximately in half because there were fewer periods per day of program availability.

3. Absenteeism, down-time, and conflicting school commitments caused some students to have a completely different DISCOVER experience from other students. In other words, some experimental subjects used all the DISCOVER material available with a full 12-15 hours at the terminal; other experimental subjects, though scheduled for an equal amount of time, actually used as little as the first one or two modules due to poor attendance habits, technical malfunction, and/or need to attend examinations or other legitimate school functions during the appointed time. Although the effect which such short use of the system could have is in question, the students in this latter group have been included as "experimental" subjects in the reporting of data.

4. The technical half of the DISCOVER development team was not able to complete the programming of the total system by February 1, 1976, as scheduled and planned. The results of this situation were that a) update tapes, adding newly-programmed developments, had to be applied to the Baltimore system each week, causing technical difficulties and surprises;

and b) experimental subjects did not get to use some of the potentially most helpful parts of the system, such as Modules 5 (Making a List of Occupations to Explore) and 8 (Exploring Specific Career Plans), because they were not finished by the time of the completion of the field trial.

Research Questions

Due to the field conditions noted, this experience was considered to be a short, first-run field trial rather than an extensive, controlled field test. For this reason, the research questions which were asked were general in nature:

1. What is student reaction to DISCOVER?

   Answers were sought to this question by three methods: observation of use by a DISCOVER staff member; completion of questionnaires; and a structured interview with a DISCOVER staff member.

2. What is parent reaction to student use of DISCOVER?

   Answers were sought to this question by means of a questionnaire which was sent home with a cover letter, asking for anonymous return in a self-addressed, pre-stamped envelope.

3. What are the effects of use of DISCOVER upon students?

   Answers were sought to this question by two methods: statistical analysis of some specific items on student questionnaires; and the post-trial administration of two instruments, the Assessment of Career Development (American College Testing Program, 1973) and the Career Development Inventory (Super, et al., 1975). Some of the hoped-for outcomes of system use were translated into the following six research questions:

   Research Question 1: What change, if any, is effected in self-knowledge due to use of the system?

   Hypothesis: Students who use the DISCOVER system will show an increase in knowledge and awareness of personal values, competencies, and interests.

Research Question 2: What change, if any, is effected in occupational knowledge as a result of system use?

Hypothesis: Students who use the system will show a significant increase in cognitive knowledge about and an awareness of Holland's six occupational clusters.

Research Question 3: What change, if any, is effected in decision-making and career-planning skill as a result of use of the system?

Hypothesis: Students who use the system will show an increase in decision-making and career-planning skill.

Research Question 4: What change, if any, is effected in progress toward specification of career goals?

Hypothesis: Students who use the system will show a significant move toward specification of both educational and vocational goals.

Research Question 5: What change, if any, is effected in vocational maturity?

Hypothesis: Students who use the system will show an increase in vocational maturity.

Research Question 6: What change, if any, is effected in vocational exploratory behavior?

Hypothesis: Students who use the system will show an increase in vocational exploratory behavior.

## Organization of the Report

Section II of this report will describe the treatment, selection of experimental subjects, and instruments used in the DISCOVER field trial. Section III will report the findings, and Section IV will present inferences drawn from those findings.

## II. Method

### Subjects

The selection of subjects for the field trial of DISCOVER can be considered at three levels: the selection of a school district for the study; the selection of schools within that district; and the selection of subjects within those schools.

The DISCOVER project did not have sufficient funds or computer resources to run the field trial from its own development site. It therefore became necessary to seek school districts within commuting distance of the DISCOVER development site which already had compatible computer hardware and software and which might be convinced to provide the computer time, facilities and subjects for the trial in return for a promise of two free years of use and maintenance of the product after its completion. The DISCOVER staff identified three large school districts within commuting distance in Maryland which already had compatible computer hardware and software. The Project Directors communicated with appropriate personnel in these districts, made appointments with them, and went to each of these districts with the full story of DISCOVER and its plans for field trial. Districts were asked to consider the possibility of hosting the field trial. After the first informational meeting, three of the four districts indicated an interest. A second informational meeting was held at the DISCOVER development site, at which further information was given about project needs and requirements and a demonstration was provided. One of the three systems, Baltimore Public School System, indicated enthusiasm and administrative support for hosting the field trial. Letters of agreement were exchanged.

The Project asked that schools be selected within the school district which provided these characteristics: a) students at both the junior high and senior

high level, i.e. grades 7-12; b) students which were representative of a national population in terms of distribution by ability, reading achievement, racial balance, etc.; and c) students which would be representative of students nationwide in the lower socioeconomic class and the middle socioeconomic class. With these guidelines, two sites within the city of Baltimore were selected. One was a junior high school of approximately 1,510 students in grades 7-9 with a 99+% black population. This school was located in a neighborhood which had made a transition from middle-class white to middle- and lower-class black. Using the Reading Achievement score of the Iowa Tests of Basic Skills as a measure, the population of this school was overwhelmingly in the lower 50% of a national distribution. The second site was a senior high school location with students at grades 9-12 level. The DISCOVER facility served students from a girls' high school of approximately 2,229 students enrolled in a traditional curriculum and a boys' high school of approximately 2,102 students specializing in the mathematical and physical sciences. Students in these schools, which share a common campus, are admitted by application from schools all over the city of Baltimore. Distribution by race is approximately 50% black and 50% white. Using the Reading Achievement score of the Iowa Tests of Basic Skills as a measure of reading skill, the population exhibited a fairly even distribution over the four quartiles of a national distribution.

Within these two test sites, experimental and control subjects were selected by making use of a stratified random sampling technique. A computer program was written by the Baltimore Public Schools data center which randomly selected students from all eligible members of a subgroup. The Project staff stipulated that the experimental and the control groups had to be of a specified size and that those groups must be balanced on the variables of grade level, sex, and reading achievement quartile (using national norms of the Reading Achievement score of the Iowa Tests of Basic Skills at the last date of administration by the school district)

No attempt was made beyond this to match the subjects in the experimental and control groups. The sample sizes were as indicated in Table 1.

READING ACHIEVEMENT QUARTILE & SEX

| Grade | 1 M | 1 F | 2 M | 2 F | 3 M | 3 F | 4 M | 4 F | Total |
|---|---|---|---|---|---|---|---|---|---|
| 7 | | 1 | 1 | | | 1 | 1 | | 4 |
| 8 | 1 | | | 1 | 1 | | | 1 | 4 |
| 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| 10 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 12 |
| 11 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| 12 | 1 | 1 | 1 | 1 | 11 | 1 | 1 | 1 | 8 |
| | | | | | | | TOTAL | | 44 |

Table 1. Size and Distribution of DISCOVER Experimental and Control Groups

Apparatus

Two IBM 3270 cathode ray tube terminals with light pens and one printer (used by student to make a paper copy of any screen displays desired) were installed in a specially-designated DISCOVER room at the junior high school. Four cathode ray tube terminals with light pens and one printer were installed in a specially-designated DISCOVER room, adjoining the guidance department, at the senior high school site. All necessary control units, phone modems, and phone lines were also installed in order to connect these terminals to the central IBM 370-145 computer in the Baltimore City School System Data Processing Center, approximately seven miles away. Two posters which provide information about the DISCOVER system and copies of the Student Resource Guide were also placed at the two test sites.

Procedure

The steps in the procedure, which spanned the time interval from April 15, 1976, through May 30, 1976, were as follows:

1. The experimental subjects were called together for a group meeting. At this meeting the DISCOVER system was explained, a short demonstration was provided, the reasons for our conducting a field trial were explained, and the student's level of involvement was explained.

2. A presentation was made at a general faculty meeting about DISCOVER and the design and plan for the field trial.

3. A full day inservice training session was held for all members of the guidance staffs at all three schools.

4. A letter was sent home to parents of experimental subjects with a DISCOVER brochure enclosed explaining that the students had been randomly selected for participation, that the student record had been stored in the computer, that students would be taken out of class and subjected to research techniques, that parents could come to see the operation, and that students could be removed from the study upon request.

5. A weekly schedule was distributed to experimental students and faculty which scheduled each student for 2-3 uses of the system weekly ( a total of 10-15 uses), removing the student from classes on a rotating basis.

6. Experimental subjects used the DISCOVER system in systematic order, that is, in the way in which it is laid out in the arrow diagram. The number of modules which each student used depended upon his or her reading speed, record of attendance, and the amount of time spent in following possible side-branches of the program. Experimental subjects in the study used from one module (the Entry Module) through all completed modules. No students used Module 1B (Playing a Values Game) or subparts of Module 8 (Local Jobs; Military; Technical and Specialized Schools; Apprenticeships; specific college information) since these were unfinished at the time of the field trial.

7. Students were observed throughout their use of the system by a DISCOVER staff member. Students completed a form (see Appendix B, Item 1) at the close of each session which attempted to capture their reactions to the material in that module as well as to ask for a report of exploratory activities since their last use of the system. Students were encouraged to report verbally or on the form any reactions, either positive or negative, to DISCOVER. Students were also asked to record on a separate form any words which they could not understand or any ideas which were difficult to understand.

8. At the end of the six-week period all students in the experimental group were asked to complete the DISCOVER Student Questionnaire (see Appendix B, Item 2) and to have an interview with a DISCOVER staff member (see Appendix B, Item 3). Students in both the experimental and control groups were asked to take the following instruments: The American College Testing Program's Assessment of Career Development (American College Testing Program, 1973); experimental subjects also responded to 15 items included as "optional local items" at the end of the instrument (see Appendix B, Item 4); and b) two sections of the Career Development Inventory (Super, et. al., 1973). These instruments are described in greater detail in the following section.

9. A letter and questionnaire (see Appendix B, Items 5 and 6) were sent to parents of students in the experimental groups in order to assess parent reaction to DISCOVER use.

Instrumentation

Two instruments and several questionnaires were used in the field trial. The primary instrument used for testing was the Assessment of Career Development, developed by the American College Testing Program and marketed by Houghton-Mifflin. This is a timed instrument, requiring 125 minutes of testing time. The instrument provides individual and group summary scores on each of the following:

I. Career Planning Knowledge (including percentage analysis of responses to individual items)

II. Occupational Preferences

A. Student selections from 25 job families

B. Educational plans based upon student selection from seven alternatives

C. Degree of certainty of occupational preferences

III. Preferred Job Characteristics

A. Job values

B. Working conditions

IV. Self Evaluation of Career Planning and Perceived Needs for Help (reported by item)

V. Reactions to Career Guidance Experiences (reported by item)

VI. Occupational Knowledge

A. Occupational characteristics

B. Occupational preparation requirements

VII. Exploratory Occupational Experiences (by six clusters)

The second instrument used was the Career Development Inventory (Super, et. al., 1975). This inventory is still in experimental form and has norms for populations in selected geographic areas. The instrument has six discrete parts, each requiring approximately 15 minutes:

Part I: Planning Orientation - measures the degree of planfulness which an individual has toward career choices; includes measures of concern with choice, specificity of planning, and self-estimated amount of occupational information.

Part II: Resources for Exploration - a self-rated assessment of the used and available resources in career planning activities, including information about educational opportunities, occupations and self.

Part III: Information and Decision Making - a cognitive measure of actual occupational information and knowledge of how to integrate personal and occupational information into educational and vocational decisions.

Part IV: Career Information - measures the amount of information possessed about career development concepts.

Part V: World of Work Information - measures the amount of general occupational knowledge possessed.

Part VI: Knowledge of Preferred Occupation - measures the amount of knowledge possessed about the occupation of the student's choice.

Due to time restrictions, only Parts I and III were administered in the field trial.

In addition to these instruments, four questionnaires and one interview schedule were used in the DISCOVER field trial. These questionnaires are included in Appendix B:

1. Student Questionnaire administered at the end of each module
2. Student Questionnaire administered at end of field trial
3. 15-item questionnaire included with administration of the Assessment of Career Development
4. Parent questionnaire
5. Interview at end of field trial

Analysis of Data

For the testing of research hypotheses, two methods of data analysis were employed. For the comparison of percentage responses on questionnaire items, chi-square tests were used. For the comparison of means of experimental and control groups, or subgroups of these, t-tests were used. Since a post-test only design was used and members of the experimental and control groups were randomly selected, it was assumed that any significant difference in means was due to the treatment.

## III. Results

Results of the field trial are presented in 3 separate sections. The first section consists of the presentation of student questionnaire responses. These data provide insight into general impressions which students had about DISCOVER and how they responded to the content of DISCOVER as delivered by the computer. The second section contains the parent responses to questionnaires. It provides an indication of how well DISCOVER was accepted as a guidance tool by the parents of the students who used it. The final section provides evidence of effects which DISCOVER had on students as measured by student questionnaires and the administration of the Assessment of Career Development and two sections of the Career Development Inventory.

### Student Questionnaire Responses

A summary of the results on the DISCOVER Student Questionnaire are listed below. Responses included in this summary are the ones selected by the largest percentage of students for each question. Please note that the percentage responses appear artificially low because of the very large number of possible responses associated with each question. All questions, response choices, and percentages are detailed in Appendix C, Table 1.

A. Questions 1-7.

1. Using a computer for guidance help

   --is fun (23%)

   --is a pleasant personal experience (21%)

   --is a great way to get information to help with choosing occupations (22%)

2. The content of DISCOVER

   --all parts of the content of DISCOVER were useful (53%)

3. Understanding the words and ideas

   --I had no trouble understanding the words in DISCOVER (34%)

--I had no trouble understanding the ideas presented in DISCOVER (24%)

4. How interesting was DISCOVER?

--I really enjoyed using DISCOVER (46%)

--I looked forward to my appointments with DISCOVER (38%)

5. Quality of the information in DISCOVER

--I think that most of the information I received was excellent (43%)

--I needed more information than I got about occupations (25%)

6. Results of using DISCOVER

--I learned a lot about occupations by using DISCOVER (20%)

--I learned a lot about how to make decisions by using DISCOVER (19%)

--I learned a lot about myself by using DISCOVER (15%)

7. Things you did after using DISCOVER

--Using DISCOVER caused me to talk to people who are in the occupation(s) which I'm interested in. (25%)

B. Local questions included on the ACD (items 7, 9, 10, 13 & 15)

7. The worst thing about DISCOVER was that the machine was broken too often or was too slow. (76%)

9. The information about occupations which I read in DISCOVER told me most of what I wanted to know. (64%)

10. In using DISCOVER I had no difficulty with words or ideas. (59%)

13. DISCOVER could be improved if the machine would move a lot faster. (44%)

15. The one response which best describes my overall reaction to DISCOVER is:

--DISCOVER helped me enough that I think all students should have an opportunity to use it. (43%)

--most of my experience with DISCOVER was useful (36%)

In addition to these structured responses the following are representative "additional comments" which students made about the system in the open-ended portion of the questionnaire:

--I got a lot more from DISCOVER than I got from some people.
--It helped me understand things clearly.
--I sent for information suggested by the computer.
--It was worth waiting for even when the computer didn't work.
--The best module was all of them.

Finally, students were given the opportunity to provide suggestions for the improvement of DISCOVER. The following are representative suggestions:

--I do not feel DISCOVER needs improving.
--Students should be taught how to operate the computer to get out of a bad spot.
--Please reduce the time in waiting for the screen to change.

A separate questionnaire was administered to each student after the completion of each module of the system. Table I summarizes student reaction to individual modules of the system.

Table I
Student Reaction to Individual DISCOVER Modules
High School Students (Junior High School Students)

| Module | It was great | It was okay | It was a bore |
|---|---|---|---|
| Entry | 90% (86%) | 10% (14%) | 0% ( 0%) |
| Understanding My Values (1A) | 61% (67%) | 36% (33%) | 2% ( 0%) |
| Learning to Make Decisions (2A) | 67% (60%) | 28% (30%) | 5% (10%) |
| Practicing Career Decisions (2B) | 60% (83%) | 35% (17%) | 5% ( 0%) |
| Learning How Occupations Can Be Grouped (3A) | 22% (50%) | 56% (50%) | 22% ( 0%) |
| Browsing Occupations (3B) | 60% ( 0%) | 40% (100%) | 0% ( 0%) |
| Reviewing My Interests and Strengths (4) | 83% ( 0%) | 17% (100%) | 0% ( 0%) |
| Making a List of Occupations to Explore (5) | 67% (N.A.) | 22% (N.A.) | 11% (N.A.) |
| Getting Information About Occupations (6) | 100% (N.A.) | 0% (N.A.) | 0% (N.A.) |
| Narrowing My List of Occupations (7) | 57% (N.A.) | 43% (N.A.) | 0% (N.A.) |
| Exploring Specific Career Plans (8) | 50% (N.A.) | 37% (N.A.) | 13% (N.A.) |

It is readily apparent from Table I that with few exceptions student response to individual modules of the system was quite positive. High School students responded very favorably to the computer-administered Self Directed Search (Reviewing My Interests and Strengths) and the Occupational Information Module (Getting Information About Occupations). Junior High students responded less favorably to the Self Directed Search but more favorably to the Values Clarification (Understanding My Values) and Practicing Career Decisions modules. Overall, response by both Junior High and High School students was certainly favorable.

Parent Questionnaire Responses

Parent response to DISCOVER was generally favorable. Following is a summary of the results on the Questionnaire for Parents. Responses included in the summary are the ones selected by the largest percentage of parents for each question. All questions, response choices and percentages are detailed in Appendix C, Table II.

A. Questions 1-5.

1. To what extent has your son or daughter discussed his or her use of DISCOVER with you?

--There has been quite a lot of discussion at different times about my son's/daughter's use of DISCOVER. (38%)

--There has been some discussion, but not much about my son's/daughter's use of DISCOVER. (31%)

2. To what extent has your son or daughter talked about each of these DISCOVER activities with you?

| NOT AT ALL | OCCASIONALLY | FREQUENTLY | |
|---|---|---|---|
| 50% | 30% | 20% | a. Values and how they relate to work. |
| 36% | 28% | 36% | b. How to make decisions. |
| 22% | 67% | 11% | c. How occupations can be grouped together. |

| NOT AT ALL | OCCASIONALLY | FREQUENTLY | |
|---|---|---|---|
| 20% | 50% | 30% | d. Interests and how they relate to work. |
| 10% | 40% | 50% | e. School courses and how they relate to work. |
| 20% | 50% | 30% | f. Abilities and how they relate to work. |
| 50% | 10% | 40% | g. Putting together a list of occupations to explore. |
| 36% | 18% | 45% | h. Job duties, entry requirements, employment outlook, etc., for a specific occupation. |
| 18% | 45% | 36% | i. Which kind of educational training to choose. |
| 45% | 27% | 27% | j. Which college, technical school, or military program to choose. |

3. Do you feel you have become more involved in your child's educational or vocational planning since his or her use of DISCOVER?

   --probably not (36%)

   --probably have (27%)

   --definitely have (27%)

4. DISCOVER has caused my son or daughter to:

   --read books, pamphlets, or other printed material (36%)

   --talk to counselors (20%)

5. Based on my knowledge of the DISCOVER guidance system, I think it has:

   --great value for young people (54%)

   --some value for young people (30%)

In addition to these structured responses the following "additional comments" are representative of parent reaction to DISCOVER.

--My son has been vocal about his interests and activities in school, sports, church and friends. However, he has discussed this project in response to our questions only. He found "Learning How

Occupations Can Be Grouped" and "Reviewing My Interests and Strengths" to be very helpful. He felt that the Values Clarification and Decision Making modules were least helpful.

--I think that DISCOVER has helped my child greatly to understand more about values and occupations. It has helped her to understand better her interests and how they can be helpful in whatever occupation she chooses in the future.

--My son felt that DISCOVER was too general in scope.

--My daughter sent away for pamphlets for further development. I think it really helped my daughter how to make some of her important decisions the right way. And show ways how she can become useful to herself and other people when she grows up.

Evidence of System Effects

The effects portion of the results section is made up of two parts; the first section presents the results of the DISCOVER Questionnaire which was a part of the ACD, and the second section presents the findings from the various scales of the ACD and the CDI.

DISCOVER Questionnaire. Data gathered by the DISCOVER Questionnaire revealed that prior to the use of DISCOVER 14% of the students "had no idea about their future vocational plans", while none of the students chose this response after having used DISCOVER. This represented a statistically significant change in the specification of vocational plans ($x^2$ (1 df) = 4.0, $p < .05$). Similarly, the percentage of students who had only a "vague idea about future vocational plans" dropped from 38% prior to the use of DISCOVER to 17% after having used it. This also represented a statistically significant change in the specification of vocational plans ($x^2$ (1 df) = 3.23, $p < .10$). Perhaps the best indicator of the effect DISCOVER had on the specification of vocational

plans was the fact that 20% more students "had made up their mind which occupation to enter" after having used DISCOVER.

In terms of effects on future educational plans, the only significant difference observed was that the percentage of students responding that they "had no idea about their future educational plans" dropped from 10% prior to the use of DISCOVER to zero after having used DISCOVER ($x^2$ (1 df) = 3.0, $p < .10$). This suggests that students had moved toward an increased specification of their educational plans as a result of having used DISCOVER.

The results of other effects questions included on the DISCOVER questionnaire are summarized below. The responses included are the ones selected by the largest percentage of students for each question. All questions, response choices and percentages are detailed in Appendix C, Table 3.

5. Using DISCOVER primarily caused me to limit or narrow the number of occupations I am considering. (48%)

8. Using DISCOVER caused me to do some reading about occupations and/or educational opportunities. (29%)

14. As a result of using DISCOVER, I learned:

--how to divide occupations into groups or categories (25%)
--more about my values (17%)
--more about my abilities (17%)
--a lot about occupations (17%)

ACD and CDI Scales. Although the responses to a few specific questions on the ACD indicated some positive effects, the overall results on both the ACD and the CDI were disappointing. There was no significant difference

between the experimental and control groups for either high school or junior high school students on any of the scales of the ACD or the CDI. This outcome, while disappointing, is not inconsistent with other study results and will be discussed in section IV.

## IV. Discussion

The overall reaction to DISCOVER as measured by Student Questionnaires was very favorable. More than 50% of the students felt the best thing about DISCOVER was all of the following: (1) the machine was fun to work with, (2) it helped relate information about self to occupations, (3) it provided a lot of information, and (4) it was objective. More than 60% of the students believed that DISCOVER told them most of what they wanted to know about occupations. Seventy-nine percent either thought that DISCOVER helped them enough that all students should have the opportunity to use it or that it was useful in helping to understand themselves better and in making good vocational and educational choices. Over 80% of the group said they really enjoyed using DISCOVER or looked forward to their appointments with DISCOVER, and seventy-five percent either thought that it was fun, was a pleasant personal experience, or a great way to get information to help with choosing occupations. Such findings are consistent with what is known of other similar computer-based guidance systems (Chapman, et. al., 1973, Harris, 1972; Myers, et. al., 1971; Impelleteri, 1968).

After the use of each DISCOVER module, students were asked to fill out a short questionnaire. The questionnaires were then analyzed to determine whether overall response to the system varied with the number of times a student had used it. It was hypothesized that students would respond more favorably to the system on their first use because of the excitement and newness of the computerized delivery system ("halo effect"). Results of this analysis suggest that "halo effect" may account for at least some of the initial enthusiasm which students expressed for the system (over 90% of the students said, "it was great" after their first use). This high degree of enthusiasm diminished slightly after several uses of the system, however, and subsequent "high" positive module ratings seemed

to more accurately reflect the perceived usefulness of module content. Even when questionnaire data resulting from the students' first use of the system were left out of the analysis, over 64% of all students who participated in the field trial continued to believe that DISCOVER "was great". Thus the individual module questionnaires confirmed the positive response as measured by the student questionnaire.

Positive student response to the system was further confirmed by responses to the questionnaires returned by parents of the experimental subjects. Ninety-four percent of the parents responded that use of DISCOVER had been discussed in the home. Home discussions of DISCOVER most frequently concerned how to make decisions, school courses and how they relate to work, job duties, entry requirements, employment outlook, etc., for specific occupations. Parents reported that use of DISCOVER stimulated their sons or daughters to read books, pamphlets, and other printed materials about occupations, and 84% concluded that from what had been discussed at home the DISCOVER guidance system was valuable.

In addition to answering specific questions, students had the opportunity to indicate what they liked most about DISCOVER and what benefits they had received during the field trial. These were obtained through a structured interview at the end of the field trial. Students often mentioned that being able to learn how to make decisions and being introduced to values clarification were of benefit. Many students said that using DISCOVER had helped them to learn more about themselves; some mentioned this separately, some in relationship to decision-making and values. Others said they most liked the wide choice of occupations and the large amount of information that was available.

The one dissatisfaction that students felt most keenly about their use of DISCOVER was the number cal problems which caused excessive down time, program problems, and occasionally slow response time. Students who arrived for

their scheduled appointment with DISCOVER only to learn that the system was not operational were quite naturally disappointed. Several experiences like this were a source of negative reinforcement to many of the students. Some were frustrated at missing a class to come and wait for DISCOVER, and others were anxious that they would not complete as much of the system as they had hoped. The staff was also frustrated by these experiences at the field test sites. Other problems mentioned in the introduction such as unfinished scripts, incomplete data files, and unforeseen program bugs due to weekly update tapes were also a source of frustration for both staff and students.

Nevertheless, students viewed their overall experience with DISCOVER in very positive terms. All of the students said they would recommend DISCOVER to a friend and many of them suggested that we could improve DISCOVER by making it available to more students.

The rather disappointing findings regarding system effects based on the ACD and CDI can be explained in a number of ways. Certainly one would expect the many design compromises which were discussed in the introductory section of this report to seriously limit the measureable effects of the treatment. Nevertheless, small sample sizes, poor controls and inadequate technical operation cannot explain the fact that while the ACD and CDI scales showed no significant effects as a result of the treatment, the student questionnaire findings were significant. One can only speculate why the findings were so disparate. One extreme explanation might be that DISCOVER is having no effects on users, though this seems unlikely. At the other extreme, one might question whether or not our use of the ACD and the CDI as outcome measures was a valid use of these two instruments. It seems likely that the true explanation lies somewhere between these two positions. Hopefully future research will yield answers to this and other difficult measurement problems which career development specialists now face.

Perhaps some of the most important results of the field trial were conclusions which the guidance staff made regarding the computer-assisted delivery system. These conclusions were not expected or sought-after results, but rather they emerged as serendipitous findings. Although they are based solely on observational data, they are included as a part of this report because of their generalizeability to other computerized delivery systems. The order of presentation in no way implies that any one conclusion is more important than any other.

1) DISCOVER is a complicated, comprehensive, guidance treatment. Most students require several 40 minute sessions of system use before they begin to really understand the systematic guidance design well enough to use it to maximum advantage. Because of the comprehensive nature of the design, a certain minimal level of abstract reasoning ability and reading skill is required on the part of the user. Our observations suggest that the system, while being useful to junior high students, is probably more useful to high school students.

2) There appears to be a direct correlation between system response time and student acceptance of and satisfaction with the guidance content of the system--the more rapid the response time, the more favorably the treatment is received.

3) Modules of the system which utilize the computer's capabilities to carry out search strategies and to retrieve information rapidly are perceived as being the most valuable parts of the system by most students.

4) Maintenance of maximum system flexibility and the avoidance of mechanistic routines are critical system components which lead students to perceive DISCOVER use as a warm personal experience rather than a

cold mechanical one. In many cases, what is most efficient from a programming point of view is not desirable from the point of view of creating a guidance experience which will be warm and personal.

5) Module content must be designed very carefully with an eye to avoiding dull, contrived exercises and experiences. Observational data suggest that rather than ploughing through boring sections of the system which precede sections of vital information, students will call upon the system's flexible design to out of the boring sections. This sometimes causes students to miss particularly critical portions of the system.

6) Students do respond favorably to computer delivered value clarification and decision making guidance materials. Whether or not such materials can be more effeciently delivered by means of a computer than by individual or group sessions is a research question not addressed by this field trial.

7) Although the DISCOVER system was designed to run on a large IBM 3270 cathode ray tube terminal with a 1920 character screen, observational data suggest that students do not respond favorably to very "full" screens of script--the amount of actual written material which appears on any one frame (screen) should be less than 1000 characters. Positioning of text on the screen is also very important. Students will respond much more favorably to written material if it is strategically positioned on the screen than to that same material presented in random fashion.

8) The strategic use of graphic displays is critical to the maintenance of student interest. The creative use of graphics greatly enhances the quality of the guidance experience.

In summary, like most field trials, the DISCOVER field trial was a limited success. Despite many hardships and compromises, a great deal of valuable data was collected. Many of the modifications suggested by students, staff and the data have been incorporated in the final version of DISCOVER. Other more complex changes could not be incorporated for lack of time and funding. Nevertheless, one thing seems certain; DISCOVER is a powerful treatment. Like any treatment it will benefit greatly from continued research and development. It is the goal of the DISCOVER Foundation to fulfill this need; to insure that the DISCOVER System is continuously maintained, modified and updated to the end that millions of students nationwide may benefit.

REFERENCES

The American College Testing Program. Handbook for the ACT Assessment of Career Development.. Iowa City, Iowa: Author, 1973.

Chapman, W., Norris, L., & Katz, M. SIGI: Report of a pilot study under field conditions. Princeton, New Jersey: Educational Testing Service, 1973.

Harris, J. E. Analysis of the effects of a computer-based vocational information system on selected aspects of vocational planning. Unpublished doctoral dissertation. Northern Illinois University, DeKalb, 1972.

Impelleteri, J. T. Computer-assisted occupational guidance: The development and evaluation of a pilot computer-assisted occupational guidance program. (Final report) University Park: Pennsylvania State University, Vocational Education Department, 1968.

Maola, J. F. An assessment of career information between OWE students using a counselor-based vs. computer-based information system. Unpublished doctoral dissertation. The University of Akron, Akron, 1974.

Melhus, G. E. Computer-assested vocational choice compared with traditional vocational counseling. Unpublished doctoral dissertation, Illinois Institute of Technology, 1971.

Myers, R. A., Lindeman, R. H., Forrest, D. J., & Super, D. E. Preliminary report: Assessment of the first year of use of the education and career exploration system in secondary schools of Genesee County, Michigan. New York: Teachers College, Columbia University, 1971.

Myers, R., Thompson, A., Lindeman, R., Super, D., Patrick, T., & Friel, T. Educational and career exploration system: Report of a two-year trial. New York: Teachers College, Columbia University, 1972.

Price, G. E. A comparison of computer and counselor effectiveness in assisting high school students explore and select courses. Unpublished doctoral dissertation, Michigan State University, 1971.

Super, D. E., Bohn, J. J., Jr., Forrest, D. J., Jordaan, J. P., Lindeman, R. H., & Thompson, A. S. Career Development Inventory, Form I. New York: Teachers College, Columbia University, 1971.

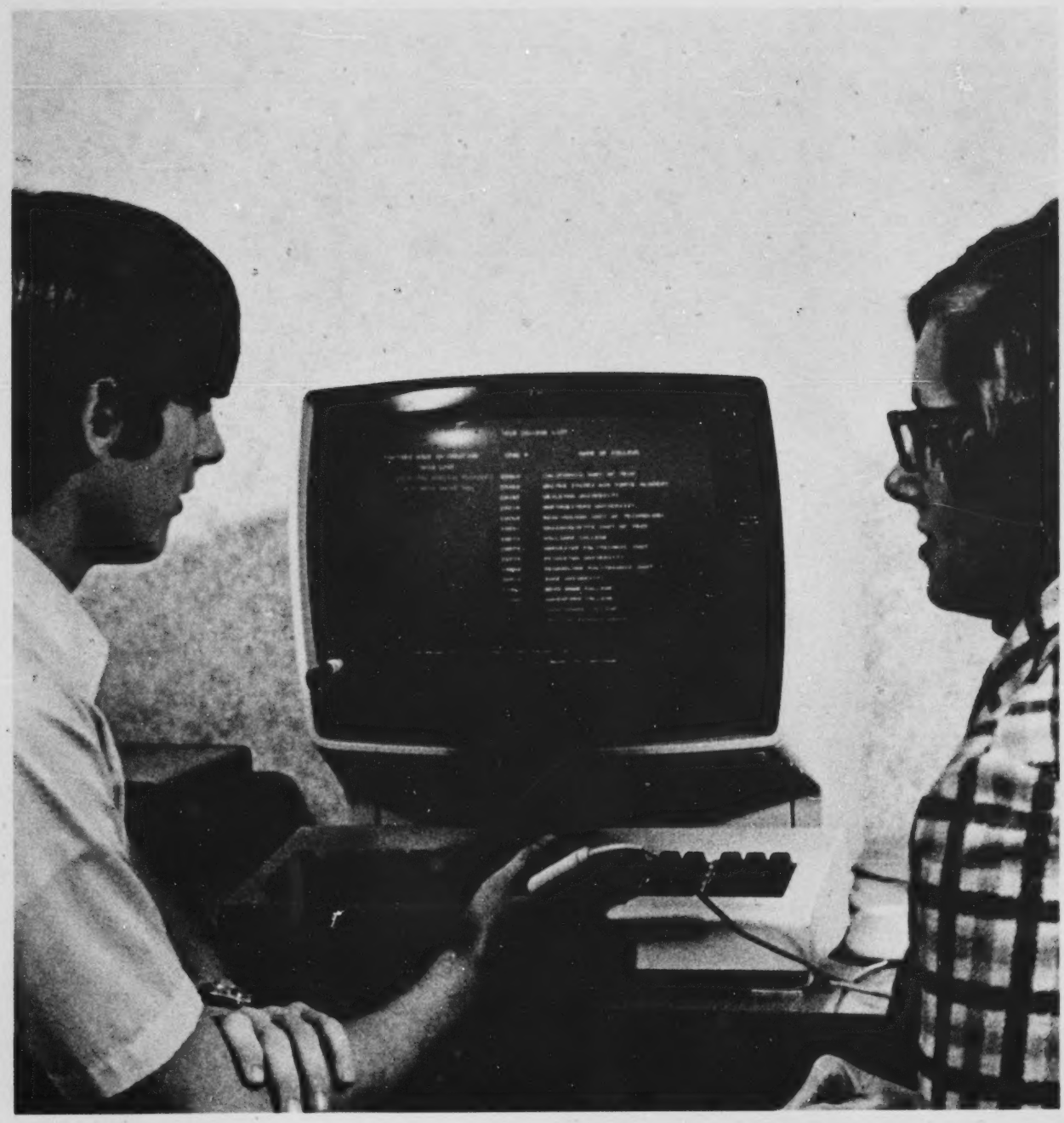
Super, D. E., et. al. The Career Development Inventory. (Experimental form) New York: Teachers College, Columbia University, 1975.

Thompson, A. S., Lindeman, R. H., Clack, S., & Bohn, J. J., Jr. Educational and career exploration system: Field trial and evaluation in Montclair High School. New York: Teachers College, Columbia University, 1971.

# APPENDIX A

# A Computer-Based Career Guidance & Counselor-Administrative Support System

The Career Guidance System



COPYRIGHT©
DISCOVER FOUNDATION, INC. 1976

The purpose of this brochure is to introduce you to DISCOVER, a computerized system which assists counselors in the delivery of career guidance services. DISCOVER is designed for use with students in grades 7-12 and has undergone an extensive field trial. It provides a systematic set of guidance experiences through interactive dialogue at television-like terminals called cathode ray tube terminals. These terminals may be placed in your guidance office, career resource center, or library and connected by phone lines to an appropriate computer anywhere. Students will want to use the system many times throughout the grades 7-12 years.

## Why Should You be Interested in DISCOVER?

Recent national surveys have shown that most students and guidance professionals believe there is a drastic need for the improvement and increase of career guidance services at all age levels.

Meeting these expressed needs is a very difficult problem. Unfavorable counselor-student ratios plus heavy counselor time demands for administrative and clerical duties make one-to-one assistance with career development virtually impossible. With the recent career education emphasis, you are probably now struggling with ways to solve these problems in your own institution.

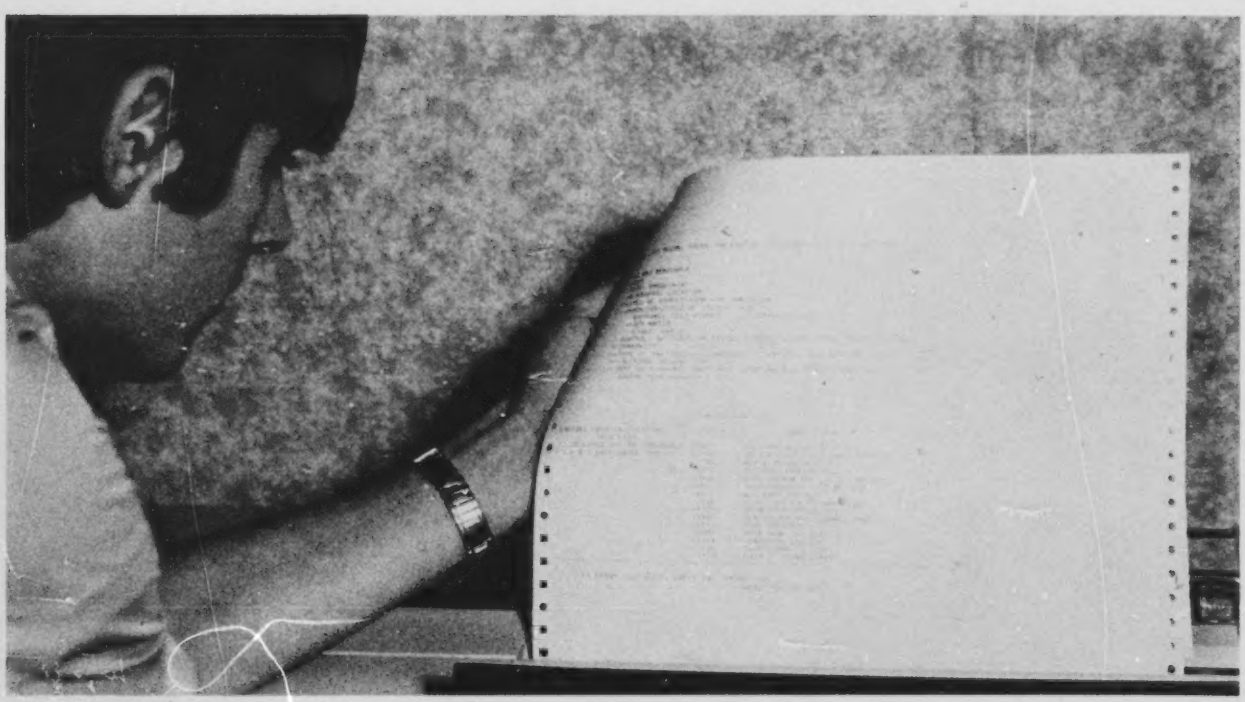
DISCOVER attempts to help meet the need for additional career guidance. It provides systematic assistance with career development tasks on an individualized and one-to-one basis throughout six of the most critical years for vocational and educational decision making.

## Why Use a Computer to Help with Career Guidance?

The DISCOVER development team does not suggest that counselors be replaced by computer terminals. However, the team has identified guidance tasks which the computer can do as well as, or better than counselors and built them into the DISCOVER system. A professional manual has also been prepared with ideas for program development which make best use of the counselor and the computer together. It is hoped that DISCOVER products will provide increased career guidance to students, remove clerical and information-giving tasks from counselors so that they can provide truly professional services, and help guidance departments become more cost-efficient.

The computer has many capabilities which make it a valuable guidance tool. It can store vast quantities of information about occupations, colleges, technical-specialized schools, military programs, financial aid, apprenticeships, and local jobs with ease. Such information can be retrieved and updated quickly from a range of different terminal devices. The computer can combine occupational or educational characteristics desired by the student, search through the appropriate data file and retrieve the needed information with tremendous speed. Since the computer can also store information about each student, it can easily relate information about the user to information about a given occupation, program or school. This creates new and highly useful information for career decision making. The technology of cathode ray tube terminals allows the development of highly interactive dialogue between the user and the computer files, thus simulating a structured interview. This individualized attention can be provided to several students at a time, depending upon the number of terminals available. The computer's ability to store key information about each student's use of its program makes it possible for the user to have a continuing experience over the secondary school years with the computer providing review at each new use.

Several computer-based guidance systems have been in use during the past ten years. Enough experience has accumulated that we know computerized systems have a very high degree of student appeal. Students enjoy using computers and appreciate their objectivity. Available research data indicate that use of computer-based systems produces some real gains in occupational information, vocational maturity, and specificity of career plans.



## What Can DISCOVER Do For You?

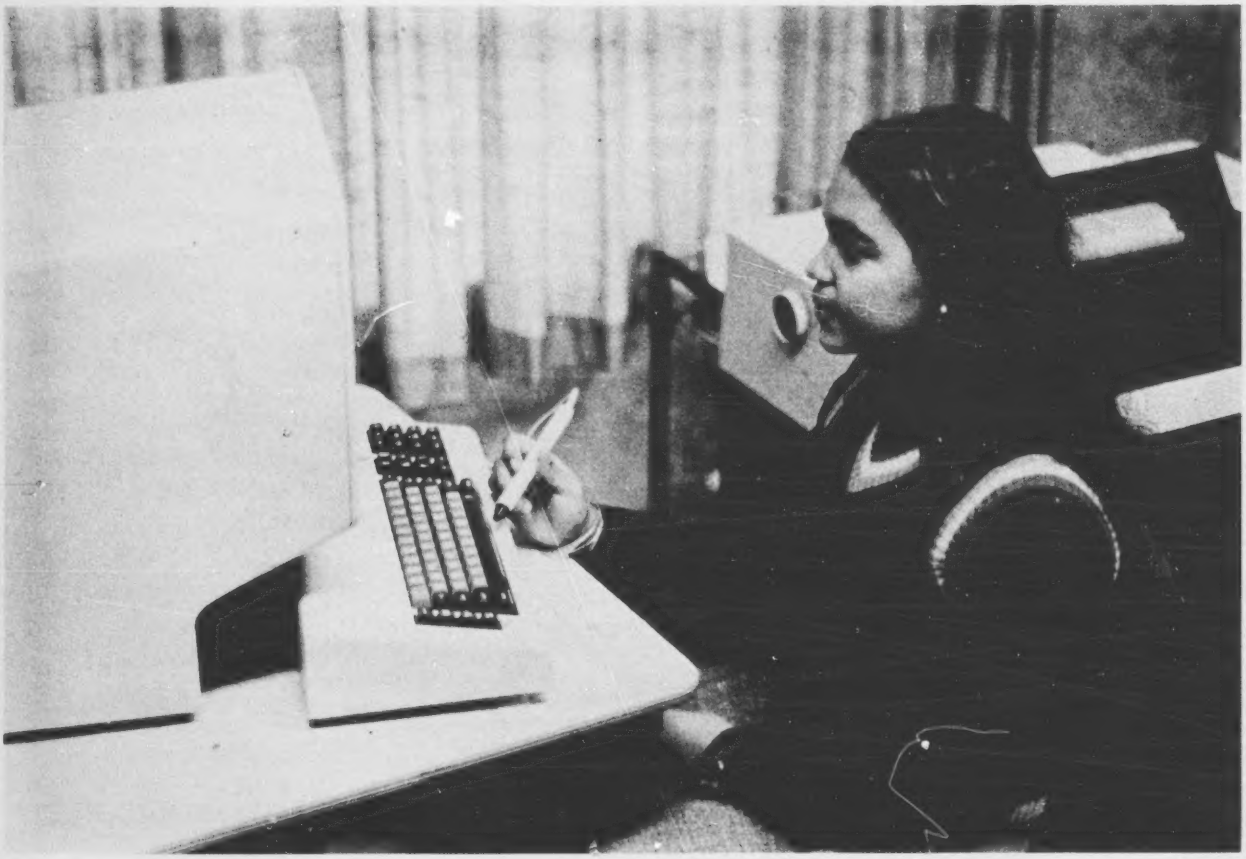
DISCOVER is a systematic career guidance program designed to enhance normal career development for grades seven through twelve. The study of career development theory makes it clear that a career guidance system should include at least the following components:

- self-information, including values, interests, and competencies
- exploration of occupations in a systematic way
- teaching and low-risk practice of decision-making
- relationship of self-information to occupational alternatives
- informational assistance with implementation of choice

DISCOVER provides assistance in all of these areas through twelve modules of interactive content.

Data about the user—including school courses and grades, test information, extracurricular activities, and work experience—are stored in the system for use in comparing occupational or training requirements with the user's past experience. Seven large data banks—occupations, four-year colleges, two-year colleges, technical and specialized schools, apprenticeships, military training programs, and graduate and professional schools—support the student's search for occupational and educational alternatives. DISCOVER is a combination of originally developed interactive dialogue and simulations, of instruments and tools used by permission of other developers, and of both originally developed and borrowed data files.

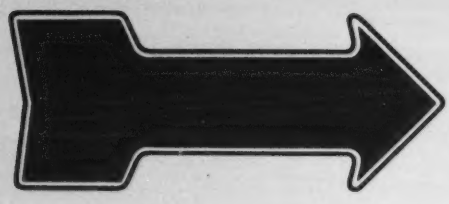
The "main line" modules of the system are graphically depicted on the following two pages.



# the DISCOVER SYSTEM

| | | | |
|---|---|---|---|
| UNDERSTANDING MY VALUES 1a | PLAYING A VALUES GAME 1b | REVIEWING MY INTERESTS AND STRENGTHS 4 | MAKING LIST OF OCCUPA TO EXPLOR 5 |
| LEARNING TO MAKE DECISIONS 2a | PRACTICING CAREER DECISIONS 2b | | |
| LEARNING HOW OCCUPATIONS CAN BE GROUPED 3a | BROWSING OCCUPATIONS 3b | | |

| | | |
|---|---|---|
| GETTING INFORMATION ABOUT OCCUPATIONS | NARROWING MY LIST OF OCCUPATIONS | EXPLORING SPECIFIC CAREER PLANS |
| 6 | 7 | 8 |



## What are the 12 modules and their content?

### 00 ENTRY

The entry module introduces the user to the System, teaches him/her how to use the terminal, and explains the many special features of the System. It monitors each person's use of DISCOVER, recording each entry and exit point to facilitate long-term use and review. Each user has the opportunity to complete an on-line survey of career development. This survey is scored and the results serve as the computer's guide in suggesting which modules of the System will be most appropriate for a given use.

### 1a UNDERSTANDING MY VALUES

This module contains a number of experiences which lead the user to think about what a value is, to analyze personal values, and to decide upon actions to implement those values. The module defines nine specific values related to occupations. The student rates the personal importance of each of these nine values and may then ask the computer to search its data file for occupations which can provide the combination and weighting of the values assigned by the user. The summary of work values is retained for later use in the System.

### 1b PLAYING A VALUES GAME

This module is a monopoly-like game designed by the DISCOVER team which may be played by one or two players. In the beginning of the game, the student is introduced to the concept of weighting values. He/She is invited to place relative weight on three possible goals: income, recognition, and happiness. Winning the game consists of reaching the goal which the user has set for himself/herself in each of these categories. The user plays the game by moving forward on a board as determined by the computer in a random rolling of the die. The spaces on which the user lands may provide him/her with an opportunity to make decisions about choice of occupation, educational options, use of leisure time, or life style. On the other hand, they may subject him/her to some of life's events, such as unexpected setbacks, unexpected opportunities, and payment for necessities. The user also acquires "plan cards" which allow him/her to have more control over life than the computer's rolling of the die affords. The way in which decisions are made on the "decide" squares adds points toward the values for which the player is playing the game. The game ends when the player receives the score previously set under the categories of income, recognition, and happiness.

### 2a LEARNING TO MAKE DECISIONS

This module attempts to teach a planful decision-making process by presenting the steps of the decision-making process in example and flow chart form. The System provides a number of exercises designed to illustrate and provide practice in the decision-making steps. It also illustrates other non-planful decision-making strategies (impulsive, delaying, painful) and assists the user to identify his/her present style of decision making.

### 2b PRACTICING CAREER DECISIONS

This module makes use of a "career decision tree" as an organizing principle for understanding how decisions affect occupational choice. Since each of the twenty branches of the tree represents a group of occupations, the tree structure is used 1) to show the key decisions which lead to entry into a given occupation, 2) to plot a given user's course up the branches of the tree, 3) to simulate the career paths of others, and 4) to allow the user the opportunity to "play" his/her own life in a variety of ways by making decisions in this low-risk, simulated way.

## 3a LEARNING HOW OCCUPATIONS CAN BE GROUPED

This module presents the world of work by way of two organizing principles: the data-people-things-ideas division (which is the American College Testing Program's refinement of the *Dictionary of Occupational Titles* classification system) and the Holland System. A number of exercises are presented to give the student practice at using these classification systems; the student's responses are monitored for the purpose of providing more instruction if needed.

## 3b BROWSING OCCUPATIONS

This module makes use of the Holland classification system presented in Module 3A as an organizational structure by which the user can browse the world of work. The module allows him/her to touch any two points of the Holland hexagon and to receive a list of occupations which fall in that particular segment of the circular world of work. The user may select titles from the list and receive a one-display description of the occupation's work setting and work tasks. This module contains descriptions of 500 occupations.

## 4 REVIEWING MY INTERESTS AND STRENGTHS

This module is John Holland's *Self-Directed Search* or ACT's *Career Planning Program* administered "on-line." Institutions will have the opportunity to select one of these alternate modules for use by students. These instruments are self-reports of the user's career-related interests, experiences, and competencies. The data, collected via the items on the instrument, give the user a focus for exploration in the world of work. The results of the instrument are interpreted to the user "on-line."

## 5 MAKING A LIST OF OCCUPATIONS TO EXPLORE

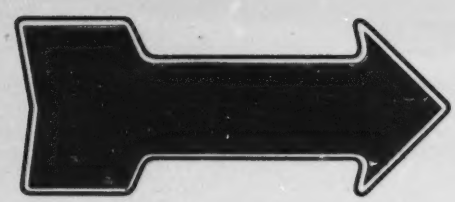
This module provides the user with five alternate ways to make a list of personal vocational options: a) by relationship of occupations to personal work values, b) by use of the results of the *Self-Directed Search* or the *Career Planning Program*, c) by selecting titles from a list of occupations by the terminal, d) by combining selected occupational characteristics (such as salary level, place of work, level of training, degree of independence, etc.) and/or e) by relating favorite school subjects to occupations.

## 6 GETTING INFORMATION ABOUT OCCUPATIONS

This module allows the user to get extensive information about the occupations on his/her list. By the voluntary selection of as many of the twenty-one questions as desired, the user may receive information about an occupation, its duties, benefits and limitations, educational requirements, future outlook, and additional sources of information. The user may also review his/her own student record (record of grades in related courses, related work or course experience, present rank in class, etc.) against the requirements of the occupation or its prerequisite training. The module also provides the capability to compare two occupations by calling in data about both simultaneously. The user leaves this module with a list of occupations in which he/she has serious interest. This list may be a shortened form of the list with which the user entered the module, or it may be a new list which has been generated on the basis of information gathered in this module.

## 7 NARROWING MY LIST OF OCCUPATIONS

The user enters this module with the list of occupations from the previous module or with a new one which he/she generates at the beginning of the module. The purpose of this module is to assist the user to narrow the list further so that he/she leaves the module with a first choice occupation in mind and a limited number of others in priority order. This narrowing is assisted by the capability to: 1) ask for additional information about any occupations on the list, 2) compare information about two occupations, and 3) analyze the remaining occupations in light of identified work values, desired level of training, and interests and competencies. Finally, the user is asked to remove occupations which are no longer of interest and to put the others in priority order. The user leaves the module with a top-priority selection.



## 8 EXPLORING SPECIFIC CAREER PLANS

The user enters this module with one specific occupation in mind at a time. The System identifies for the user all of the possible paths of training to the selected occupation. The user may choose the path of entry which he/she wishes to explore in depth and branch to any of the following sub-modules of the System.

## 8a LOCAL JOBS

This module provides an informational section about how to seek a job. It also provides a search strategy for finding a job in the local area with the characteristics desired by the user. Use of the search strategy requires that each local site develop a local job data bank.

## 8b FINANCIAL AID

This module provides three capabilities: 1) definition of standard financial aid terms; 2) information about how to obtain financial aid, including an on-line assessment of student financial need (based on a short form of ACT's Family Financial Statement); and 3) information about available sources of financial aid.

## 8c APPRENTICESHIPS

This module provides two capabilities: 1) answers to common questions about apprenticeship programs; and 2) search strategies to find apprenticeable occupations, including locating local companies which sponsor apprentices in the user's chosen occupation (requires local data file development).

## 8d FOUR-YEAR COLLEGE INFORMATION AND SEARCH

This module is a very extensive one which has two divisions: exhaustive information about college admission and selection and a search strategy. The search strategy draws upon a data file of all four-year colleges and universities in the nation, collected and maintained by the American College Testing Program. The strategy allows the user to combine characteristics in the following areas: approximately 200 majors; cost ranges; enrollment ranges; geographic locations; levels of competition for admission; student characteristics (test and class rank, sex, and racial/ethnic membership); type of control; type and size of community; type of institution; type of school year calendar; and a variety of special features. Combination of the student's selected variables produces a list of colleges which have the desired characteristics. Five displays of specific information are available about each college: entrance requirements; general information; characteristics of the freshman class; majors offered; and cost and financial aid.

## 8e COMMUNITY AND JUNIOR COLLEGES

This module provides two capabilities: answers to common questions about community and junior colleges and search strategies to find a college. Two strategies are provided: search of local college only or search of a nationwide file. DISCOVER sites may choose to use only the local search. The DISCOVER-provided college data file contains the data with which to do both searches.

## 8f GRADUATE AND PROFESSIONAL SCHOOLS

This module provides a search through a national data file of graduate and professional schools making use of characteristics very similar to those used in the four-year college search, module 8D.

## 8g TECHNICAL AND SPECIALIZED SCHOOLS

Similar to other modules in this group, this one provides general information about technical and specialized schools and a search strategy to find those which will provide the training needed for entry into a specific occupation. The data file provided by DISCOVER is a national one, containing information about approximately 11,000 schools. The local site may choose to use only a part of this file.

## 8h CONTINUING EDUCATION

This program has two sections: general information about adult and continuing education and instruction on how to find adult-continuing education opportunities in the local area. A local site might choose to enhance this module by adding a local data file of continuing education opportunities.

## 8i MILITARY INFORMATION AND SEARCH

This module provides answers to a large number of typical questions about the military. Additionally, it provides a search strategy to find the specific program within any branch of the military which provides the training needed for entry into a specific civilian occupation. The module contains the data file published in the Department of Defense *Military-Civilian Occupational Source Book*.

## What Kind of Computer Do You Need for DISCOVER?

DISCOVER is an "on-line" system designed to operate in a multi-purpose computer. (That is, all interactions take place directly with the computer by means of various terminal devices.) You may currently own or lease your own computer system. In that case, you would probably want to incorporate DISCOVER as a part of your present operations. If you do not have your own system, you may wish to find a computer which is compatible with DISCOVER and lease time on that machine, connecting terminals in your school to it by phone line. In either case, you will need:

- a medium or large size computer, operating under a virtual storage system
- visual display terminals
- direct access storage devices with at least one disk drive available for DISCOVER

Although DISCOVER has been programmed for a specific computer system, it has been organized so that it can be easily modified to run under other systems. The DISCOVER Foundation, Inc. can provide technical support for such modification. Details about the technical design and requirements of DISCOVER are available in other publications.

## How is DISCOVER Supported?

DISCOVER is the product of four years of conceptualization, implementation, and field trial effort. It was conceptualized by members of the former CVIS (Computerized Vocational Information System) team. Funding from the Illinois Division of Vocational and Technical Education, the United States Office of Education and the International Business Machines Corporation made the system possible. The product is continuously maintained, updated, evaluated, and improved by a not-for-profit research and development foundation, called the DISCOVER Foundation, Inc. The Foundation also provides support for installation and operation.

*If you would like to know more about DISCOVER,* please write or call for additional publications and/or a demonstration:

DISCOVER Foundation, Inc.
Post Office Box 363
Westminster, Maryland 21157
301-848-1113

APPENDIX B, Item 1

*Project DISCOVER*
*Student Questionnaire*

*DATE:* _____ *STUDENT NAME:* _____

*MODULE USED:* _____ *SCHOOL:* _____

1. *Place a check (✓) in front of one of the following to indicate how you felt about this part of DISCOVER:*

___ a. *It was great. I really found it to be interesting and useful.*
___ b. *It was okay. I didn't mind using it.*
___ c. *It was a bore. I found it to be a waste of time.*

2. *What did you especially LIKE about this module?* _____

_____

_____

3. *What did you especially DISLIKE about this module?* _____

_____

_____

4. *Place a check (✓) in front of any of the following which you have done since you last used DISCOVER.*

___ a. *Talked with your parent(s) about career planning.*
___ b. *Talked to someone who works in an occupation you're interested in.*
___ c. *Talked to a teacher about career planning.*
___ d. *Talked to your counselor about career planning.*
___ e. *Read a book or pamphlet about occupations or schools.*
___ f. *OTHER (please write in):* _____

_____

5. *Were you able to understand what you read? Please circle one of the following letters*

| | *words* | *ideas* | *directions* |
|---|---|---|---|
| a. *No problem* | a | a | a |
| b. *Some problems* | b | b | b |
| c. *A big problem* | c | c | c |

6. *Please tell us anything you would like to about today's experience? (You may use the back of this sheet if you would like.)*

_____ _____

_____

_____

APPENDIX B, Item 2

DISCOVER I.D. NUMBER

_____

Project DISCOVER

STUDENT QUESTIONNAIRE

Please place a check (✓) in front of any of the following statements which you agree with.

1. Using a Computer for Guidance Help

___ a. It is fun to use a computer terminal

___ b. It is boring to use a computer terminal.

___ c. The computer is very objective; it doesn't care about my grades or sex or race.

___ d. Using DISCOVER is a very cold, impersonal experience.

___ e. Using DISCOVER is a pleasant personal experience.

___ f. The computer never works.

___ g. It's very frustrating when the computer doesn't work.

___ h. Students should always have help from a human, never a computer.

___ i. The computer is a great way to get information to help with choosing occupations.

___ j. The computer is slow.

Additional comments: _____

_____

2. The Content of DISCOVER

___ a. There's a lot more stuff there than is needed.

___ b. I found all the parts of DISCOVER to be useful.

___ c. There were a lot of things left out which I needed.

___ d. I had a hard time understanding what some of the material had to do with career decision making.

___ e. I didn't like having to use it in a certain order.

___ f. The best module was _____

Additional comments: _____

_____

3. *The Words and Ideas in DISCOVER*

___ a. *I had a hard time understanding a lot of the words.*

___ b. *I had difficulty understanding some of the words.*

___ c. *I didn't have any trouble understanding the words.*

___ d. *I didn't understand some of the ideas being presented.*

___ e. *I didn't have any trouble understanding the ideas being presented.*

___ f. *DISCOVER is too difficult for students of my age.*

*Additional comments:* _____

_____

4. *How Interesting DISCOVER Was*

___ a. *I really enjoyed using DISCOVER.*

___ b. *I looked forward to my appointments with DISCOVER.*

___ c. *Sometimes I came to school just because I wanted to use DISCOVER.*

___ d. *Using DISCOVER was okay, but no big thing.*

___ e. *I really hated using DISCOVER.*

___ f. *I really dreaded my appointments with DISCOVER.*

___ g. *Sometimes I cut school in order to avoid using DISCOVER.*

*Additional comments:* _____

_____

5. *Quality of the Information in DISCOVER*

___ a. *I got all the information I needed from DISCOVER.*

___ b. *I needed more information than I got about occupations.*

___ c. *I needed more information than I got about myself.*

___ d. *I needed more information than I got about colleges, technical schools, military programs, etc.*

___ e. *I needed more information than I got about decision making.*

___ f. *I think that some of the information I received was poor.*

___ g. *I think that most of the information I received was excellent.*

*Additional comments:* _____



_____

Place a check (✓) in front of any of the following statements which you agree with.

6. Results of Using DISCOVER

___ a. I had some career plans in mind before using DISCOVER (occupations and/or plans for going to school), and I still have those same plans in mind.

___ b. DISCOVER helped me feel more sure about career plans which I already had.

___ c. I had no idea what occupations to enter when I started using DISCOVER; now I feel pretty sure.

___ d. DISCOVER made me doubt career plans I had before; now I'm confused.

___ e. I had no idea what occupations to enter when I started using DISCOVER; I still have no ideas.

___ f. I learned a lot about myself using DISCOVER.

___ g. I didn't learn anything about myself by using DISCOVER.

___ h. I learned a lot about occupations by using DISCOVER.

___ i. I didn't learn anything new about occupations by using DISCOVER.

___ j. I learned a lot about how to make decisions by using DISCOVER.

___ k. I didn't learn anything new about how to make decisions by using DISCOVER.

Additional comments: _____

_____

7. Things You Did After Using DISCOVER

Using DISCOVER caused me to:

___ a. want to see my counselor more.

___ b. want to see my counselor less.

___ c. talk with teacher(s).

___ d. talk with parent(s).

___ e. use books and other materials in the school library.

___ f. use books and other materials in the guidance office:

___ g. talk to people who are in the occupation(s) which I'm interested in.

___ h. other: _____

*Additional comments:* _____

_____

_____

8. *Please give us any suggestions for improving DISCOVER which you feel are important.*

_____

_____

_____

_____

_____

APPENDIX B, Item 3

*Project DISCOVER*
*Interview Questions to be Asked of a Random Sample*
*of Experimental Subjects (from Groups B+C)*
*at the End of Field Trial*

1. *What did you like most about using DISCOVER?*

2. *What did you dislike about using DISCOVER?*

3. *Would you recommend it to a friend?*

4 *What do you think we could do to make DISCOVER a better system for students?*

5. *What benefits, if any, do you think you received from using DISCOVER?*

6. *Did using DISCOVER cause you to do anything else to help with your decision imaking, such as:*

___ *talk to your parents*
___ *talk to your counselor*
___ *talk to teachers*
___ *talk to people in certain occupations*
___ *use material in the library*
___ *other things*

7. *What is your present status in regard to educational and vocational choices?*

*What was it when you began to use DISCOVER?*

APPENDIX B, Item 4

DISCOVER Questionnaire

1. Before using DISCOVER, I

   a. had no idea about my future vocational plans.
   b. had some vague ideas about my future vocational plans.
   c. had narrowed my vocational choices to some broad areas.
   d. had narrowed my vocational choices to less than 10 occupations.
   e. had made up my mind which occupation to enter.

2. Before using DISCOVER, I

   a. had no idea about my future educational plans.
   b. had some vague ideas about my future educational plans.
   c. had narrowed my educational plans to one or two possible types of training.
   d. had selected a particular road of training, but not a specific school or program.
   e. had selected a specific school or program for further education or training.

3. After using DISCOVER, I

   a. had no idea about my future vocational plans.
   b. had some vague ideas about my future vocational plans.
   c. had narrowed my vocational choices to some broad areas.
   d. had narrowed my vocational choices to less than 10 occupations.
   e. had made up my mind which occupation to enter.

4. After using DISCOVER, I

   a. had no idea about my future educational plans.
   b. had some vague ideas about my future educational plans.
   c. had narrowed my educational plans to one or two possible types of training.
   d. had selected a particular road of training, but not a specific school or program.
   e. had selected a specific school or program for further education or training.

5. Using DISCOVER primarily caused me to:

   a. increase or expand the number of occupations I am considering.
   b. limit or narrow the number of occupations I am considering.

(Continued on following page.)

c. select one specific occupation.
d. confirm my plans to enter an occupation(s) which I had already selected.
e. become confused about my choice of an occupation.

6. The best thing about DISCOVER was:

a. the machine was fun to work with.
b. it helped me relate information about myself to occupations.
c. it gave me a lot of information.
d. it was objective; it didn't care about my race or sex or anything.
e. all of the above.

7. The worst thing about DISCOVER was:

a. the machine was broken too often or too slow.
b. there wasn't enough information that I wanted to know.
c. there was too much content; it took too long to get through; it was confusing.
d. I don't like working with a machine; it is too impersonal.
e. all of the above.

8. Using DISCOVER caused me to:

a. do some reading about occupations and/or educational opportunities.
b. talk to my counselor.
c. talk to my parent(s).
d. talk to people in an occupation or in a particular school.
e. more than one of the above.

9. The information about occupations which I read in DISCOVER:

a. told me everything that I wanted to know about my occupation(s).
b. told me most of what I wanted to know.
c. was inadequate.
d. told me more than I wanted to know.

10. In using DISCOVER:

a. I had no difficulty with words or ideas.
b. I had no difficulty with words, but some difficulty with ideas.
c. I had difficulty with both words and ideas.
d. I had no difficulty with ideas, but some difficulty with words.

11. The most helpful modules of DISCOVER were: (Mark as many as you wish.)

a. Understanding My Values.
b. Learning How to Make Decisions.
c. Practicing Career Decisions (the tree).
d. Learning How Occupations Can be Grouped.
e. Browsing Occupations.
f. Reviewing My Interests and Strengths (the Self-Directed Search).
g. Making a List of Occupations to Explore.
h. Getting Information about Occupations.
i. Narrowing My List of Occupations.
j. Exploring Specific Career Plans (includes four-year and two-year college information and search; technical schools, apprenticeships, military, continuing education, financial aids).

12. The least helpful modules of DISCOVER were: (Mark as many as you wish.)

a. Understanding My Values.
b. Learning How to Make Decisions.
c. Practicing Career Decisions (the tree).
d. Learning How Occupations Can be Grouped.
e. Browsing Occupations.
f. Reviewing My Interests and Strengths (the Self-Directed Search).
g. Making a List of Occupations to Explore.
h. Getting Information about Occupations.
i. Narrowing My List of Occupations.
j. Exploring Specific Career Plans (includes four-year and two-year college information and search; technical schools, apprenticeships, military, continuing education, financial aids).

13. DISCOVER could be improved if: (Mark as many as you wish.)

a. It were made a lot shorter.
b. The machine would move a lot faster.
c. The directions were simpler.
d. Fewer examples were given.
e. It had more information about me in it.
f. It were easier to read.
g. If it had more or better information about occupations.
h. There were some plan to allow me to discuss what I learn from DISCOVER with my counselor.
i. If it had things in it more appropriate for students my age.
j. All or most of the above.

14. As a result of using DISCOVER, I learned: (Mark as many as you wish.)

    a. more about my values.
    b. more about my interests.
    c. more about my abilities.
    d. how to divide occupations into groups or categories.
    e. how to explore occupations.
    f. what kind of decision-maker I am.
    g. how to make planful decisions.
    h. a lot about occupations.
    i. how to plan my career.
    j. what educational plans I need to make.

15. Please summarize your overall reaction to DISCOVER by selecting the one response which describes it best:

    a. Use of DISCOVER was a waste of time; it didn't help me at all.
    b. Most of my experience with DISCOVER was useful; I learned some things which helped me to understand myself better and to make good vocational and educational choices.
    c. All of my experience with DISCOVER was useful; it really helped me to make vocational and educational choices.
    d. DISCOVER helped me enough that I think that all students should have the same opportunity I did.

APPENDIX B, Item 5

A COMPUTER-BASED CAREER GUIDANCE
AND COUNSELOR-ADMINISTRATIVE SUPPORT SYSTEM

Dear

Since you are the parent of a teenager, I suspect that you are concerned with helping your youngster to make the best possible vocational and educational decisions. A team at Western Maryland College, funded by the United States Office of Education, has been working since 1972 to provide a new way to help students make good career decisions. Our approach uses a computer to help young people understand their interests, explore occupations broadly, find a college or technical school to get training, and many other related tasks. Your youngster has been selected to be one of the students who will have the first opportunity to use this exciting new system.

DISCOVER will be installed in Garrison for a four-month period, February through May. The computer programs which make DISCOVER run will be stored in the Baltimore City School System computer. Your child will use DISCOVER at school by using a TV-like terminal which is connected to that computer. Some information about him or her, specifically courses, grades, and test information, has been stored in the computer so it can be related to exploration of occupations or choice of type of training for an occupation.

It will be necessary for us to take your youngster out of class several times so that he/she has time to use the computer terminal. We will be careful to rotate the classes which are missed so that there will be the least possible effect. We feel certain, however, that our program will provide some real help with the selection of appropriate occupations and training for those occupations.

Since DISCOVER is brand new, we will need to observe students as they use the computer terminals and to ask them questions about this experience orally and in questionnaires. At the end of the four months,we will also send a questionnaire to you, asking what you heard about DISCOVER in home conversation.

Because we want you to understand what your youngster will be experiencing at school, we are providing two ways by which you can get further information. First we are enclosing a description of DISCOVER, Second we are inviting you to come to the school at your convenience in order to see your child at work with the computer. In addition, dont hesitate to call us at 396-0738 if you have any questions concerning this new activity for our students.

Yours truly,

Geraldine Coleman
Principal, #42

JoAnn Bowlsbey
DISCOVER Team Co-Director

Project based at Western Maryland College, Department of Education,
Westminster, Maryland 21157 Phone (301) 848-1113

APPENDIX B, Item 6

*Project DISCOVER*

*Questionnaire for Parents*

*Your answers to the following questions are confidential, and no one at your student's school will see them. Please be as frank as you can. We value your answers since we want to make DISCOVER as useful as possible for both students and parents.*

1. *To what extent has your son or daughter discussed with you his or her use of DISCOVER? Please place a check (✓) beside one of the following:*

___ a. *Not at all.*
___ b. *It was mentioned, but only briefly.*
___ c. *There has been some discussion, but not much.*
___ d. *There has been quite a lot of discussion at different times.*
___ e. *We have discussed it regularly.*

2. *Following are some of the activities which your son or daughter has been exposed to in DISCOVER. To what extent has your son or daughter talked about each of these? Please place a check (✓) in the appropriate column.*

| *NOT AT ALL* | *OCCASIONALLY* | *FREQUENTLY* | |
|---|---|---|---|
| ___ | ___ | ___ | a. *Values and how they relate to work.* |
| ___ | ___ | ___ | b. *How to make decisions.* |
| ___ | ___ | ___ | c. *How occupations can be grouped together.* |
| ___ | ___ | ___ | d. *Interests and how they relate to work.* |
| ___ | ___ | ___ | e. *School courses and how they relate to work.* |
| ___ | ___ | ___ | f. *Abilities and how they relate to work.* |
| ___ | ___ | ___ | g. *Putting together a list of occupations to explore.* |
| ___ | ___ | ___ | h. *Job duties, entry requirements, employment outlook, etc., for a specific occupation.* |
| ___ | ___ | ___ | i. *Which kind of educational training to choose.* |
| ___ | ___ | ___ | j. *Which college, technical school, or military program to choose.* |

3. *Do you feel that you have become more involved in your child's educational or vocational planning since his or her use of DISCOVER?*

___ a. *Definitely have not.*
___ b. *Probably have not.*
___ c. *Probably have.*
___ d. *Definitely have.*

4. *Which of the following things, if any, has the use of DISCOVER caused your son or daughter to do?*

___ a. *Ask you about your occupation or how you chose it.*
___ b. *Talk to relatives or acquaintances about their occupations.*
___ c. *Read books, pamphlets, or other printed materials.*
___ d. *Talk to teachers.*
___ e. *Talk to counselors.*
___ f. *Other. Please describe:* _____

_____

5. *Based upon your knowledge of the DISCOVER guidance system, how valuable do you think it is for young people?*

___ a. *Not valuable at all.*
___ b. *Has limited value.*
___ c. *Has some value.*
___ d. *Has great value.*

6. *Please write any additional comments which you care to:*

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX C, Table 1

DISCOVER I.D. NUMBER

APPENDIX C, Table 1

Poly/Western/Garrison
Phase 2

*Project DISCOVER*

*STUDENT QUESTIONNAIRE*

***Please place a check (✓) in front of any of the following statements which you agree with.***

Number of responses = 111

1. ***Using a Computer for Guidance Help***

23% a. ***It is fun to use a computer terminal***

0% b. ***It is boring to use a computer terminal.***

12% c. ***The computer is very objective; it doesn't care about my grades or sex or race.***

0% d. ***Using DISCOVER is a very cold, impersonal experience.***

21% e. ***Using DISCOVER is a pleasant personal experience.***

03% f. ***The computer never works.***

13% g. ***It's very frustrating when the computer doesn't work.***

0% h. ***Students should always have help from a human, never a computer.***

22% i. ***The computer is a great way to get information to help with choosing occupations.***

06% j. ***The computer is slow.***

*Additional comments:* _____

_____

2. *The Content of DISCOVER* Number of responses = 34

09% a. *There's a lot more stuff there than is needed.*

53% b. *I found all the parts of DISCOVER to be useful.*

12% c. *There were a lot of things left out which I needed.*

15% d. *I had a hard time understanding what some of the material had to do with career decision making.*

11% e. *I didn't like having to use it in a certain order.*

___ f. *The best module was* _____

*Additional comments:* _____

_____

3. *The Words and Ideas in DISCOVER* Number of responses = 38

0% a. *I had a hard time understanding a lot of the words.*

13% b. *I had difficulty understanding some of the words.*

34% c. *I didn't have any trouble understanding the words.*

24% d. *I didn't understand some of the ideas being presented.*

29% e. *I didn't have any trouble understanding the ideas being presented.*

0% f. *DISCOVER is too difficult for students of my age.*

*Additional comments:* _____

_____

4. *How Interesting DISCOVER Was* Number of responses = 39

46% a. *I really enjoyed using DISCOVER.*

38% b. *I looked forward to my appointments with DISCOVER.*

08% c. *Sometimes I came to school just because I wanted to use DISCOVER.*

08% d. *Using DISCOVER was okay, but no big thing.*

0% e. *I really hated using DISCOVER.*

0% f. *I really dreaded my appointments with DISCOVER.*

0% g. *Sometimes I cut school in order to avoid using DISCOVER.*

*Additional comments:* _____

_____

5. *Quality of the Information in DISCOVER* Number of responses = 40

18% a. *I got all the information I needed from DISCOVER.*

25% b. *I needed more information than I got about occupations.*

02% c. *I needed more information than I got about myself.*

08% d. *I needed more information than I got about colleges, technical schools, military programs, etc.*

02% e. *I needed more information than I got about decision making.*

02% f. *I think that some of the information I received was poor.*

43% g. *I think that most of the information I received was excellent.*

*Additional comments:* _____

_____

Place a check (✓) in front of any of the following statements which you agree with.

6. Results of Using DISCOVER Number of responses = 115

17% a. I had some career plans in mind before using DISCOVER (occupations and/or plans for going to school), and I still have those same plans in mind.

16% b. DISCOVER helped me feel more sure about career plans which I already had.

06% c. I had no idea what occupations to enter when I started using DISCOVER; now I feel pretty sure.

01% d. DISCOVER made me doubt career plans I had before; now I'm confused.

01% e. I had no idea what occupations to enter when I started using DISCOVER; I still have no ideas.

15% f. I learned a lot about myself using DISCOVER.

03% g. I didn't learn anything about myself by using DISCOVER.

20% h. I learned a lot about occupations by using DISCOVER.

01% i. I didn't learn anything new about occupations by using DISCOVER.

19% j. I learned a lot about how to make decisions by using DISCOVER.

01% k. I didn't learn anything new about how to make decisions by using DISCOVER.

Additional comments: _____

_____

7. Things You Did After Using DISCOVER Number of responses = 80

Using DISCOVER caused me to:

09% a. want to see my counselor more.

01% b. want to see my counselor less.

09% c. talk with teacher(s).

24% d. talk with parent(s).

16% e. use books and other materials in the school library.

12% f. use books and other materials in the guidance office.

25% g. talk to people who are in the occupation(s) which I'm interested in.

04% h. other: _____

*Additional comments:* _____

_____

8. *Please give us any suggestions for improving DISCOVER which you feel are important.*

_____

_____

_____

_____

_____

APPENDIX C, Table 2

APPENDIX C, Table 2

*Project DISCOVER*

*Questionnaire for Parents*

*Your answers to the following questions are confidential, and no one at your student's school will see them. Please be as frank as you can. We value your answers since we want to make DISCOVER as useful as possible for both students and parents.*

1. *To what extent has your son or daughter discussed with you his or her use of DISCOVER? Please place a check (✓) beside one of the following:*

N = 13

08% a. *Not at all.*
08% b. *It was mentioned, but only briefly.*
31% c. *There has been some discussion, but not much.*
38% d. *There has been quite a lot of discussion at different times.*
15% e. *We have discussed it regularly.*

2. *Following are some of the activities which your son or daughter has been exposed to in DISCOVER. To what extent has your son or daughter talked about each of these? Please place a check (✓) in the appropriate column.*

| *NOT AT ALL* | *OCCASIONALLY* | *FREQUENTLY* | |
|---|---|---|---|
| 50% | 30% | 20% | a. *Values and how they relate to work.* |
| 36% | 28% | 36% | b. *How to make decisions.* |
| 22% | 67% | 11% | c. *How occupations can be grouped together.* |
| 20% | 50% | 30% | d. *Interests and how they relate to work.* |
| 10% | 40% | 50% | e. *School courses and how they relate to work.* |
| 20% | 50% | 30% | f. *Abilities and how they relate to work.* |
| 50% | 10% | 40% | g. *Putting together a list of occupations to explore.* |
| 36% | 18% | 45% | h. *Job duties, entry requirements, employment outlook, etc., for a specific occupation.* |
| 18% | 45% | 36% | i. *Which kind of educational training to choose.* |
| 45% | 27% | 27% | j. *Which college, technical school, or military program to choose.* |

3. *Do you feel that you have become more involved in your child's educational or vocational planning since his or her use of DISCOVER?*

09% a. *Definitely have not.*
36% b. *Probably have not.*
27% c. *Probably have.*
27% d. *Definitely have.*

4. *Which of the following things, if any, has the use of DISCOVER caused your son or daughter to do?* N = 25

16% a. *Ask you about your occupation or how you chose it.*
12% b. *Talk to relatives or acquaintances about their occupations.*
36% c. *Read books, pamphlets, or other printed materials.*
16% d. *Talk to teachers.*
20% e. *Talk to counselors.*
0% f. *Other. Please describe:* _____

_____

5. *Based upon your knowledge of the DISCOVER guidance system, how valuable do you think it is for young people?* N = 13

08% a. *Not valuable at all.*
08% b. *Has limited value.*
30% c. *Has some value.*
54% d. *Has great value.*

6. *Please write any additional comments which you care to:*

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX C, Table 3

APPENDIX C, Table 3

G = Garrison Junior High School
PW = Poly-Western High School
B = Both Junior and Senior High Schools

## DISCOVER Questionnaire

1. Before using DISCOVER, I

| PW | G | B | |
|---|---|---|---|
| 16% | 14% | 14% | a. had no idea about my future vocational plans. |
| 26% | 71% | 38% | b. had some vague ideas about my future vocational plans. |
| 11% | 0% | 10% | c. had narrowed my vocational choices to some broad areas. |
| 21% | 0% | 17% | d. had narrowed my vocational choices to less than 10 occupations. |
| 26% | 14% | 21% | e. had made up my mind which occupation to enter. |
| 19 | 7 | 29 | -- Number of students who responded to this question. |

2. Before using DISCOVER, I

| PW | G | B | |
|---|---|---|---|
| 5% | 29% | 10% | a. had no idea about my future educational plans. |
| 32% | 29% | 34% | b. had some vague ideas about my future educational plans. |
| 26% | 0% | 17% | c. had narrowed my educational plans to one or two possible types of training. |
| 16% | 43% | 21% | d. had selected a particular road of training, but not a specific school or program. |
| 21% | 0% | 17% | e. had selected a specific school or program for further education or training. |
| 19 | 7 | 29 | -- Number of students who responded to this question. |

3. After using DISCOVER, I

| PW | G | B | |
|---|---|---|---|
| 0% | 0% | 0% | a. had no idea about my future vocational plans. |
| 17% | 14% | 17% | b. had some vague ideas about my future vocational plans. |
| 11% | 29% | 14% | c. had narrowed my vocational choices to some broad areas. |
| 33% | 14% | 28% | d. had narrowed my vocational choices to less than 10 occupations. |
| 39% | 43% | 41% | e. had made up my mind which occupation to enter. |
| 18 | 7 | 29 | -- Number of students who responded to this question. |

4. After using DISCOVER, I

| PW | G | B | |
|---|---|---|---|
| 0% | 0% | 0% | a. had no idea about my future educational plans. |
| 17% | 29% | 21% | b. had some vague ideas about my future educational plans. |
| 28% | 29% | 31% | c. had narrowed my educational plans to one or two possible types of training. |
| 28% | 29% | 31% | d. had selected a particular road of training, but not a specific school or program. |
| 28% | 29% | 28% | e. had selected a specific school or program for further education or training. |
| 18 | 7 | 29 | |

5. Using DISCOVER primarily caused me to:

| PW | G | B | | |
|---|---|---|---|---|
| 16% | 14% | 17% | a. | increase or expand the number of occupations I am considering. |
| 53% | 29% | 48% | b. | limit or narrow the number of occupations I am considering. |
| 16% | 29% | 17% | c. | select one specific occupation. |
| 16% | 29% | 17% | d. | confirm my plans to enter an occupation(s) which I had already selected. |
| 0% | 0% | 0% | e. | become confused about my choice of an occupation. |
| 19 | 7 | 29 | -- | Number of students who responded to this question. |

6. The best thing about DISCOVER was:

| PW | G | B | | |
|---|---|---|---|---|
| 5% | 43% | 21% | a. | the machine was fun to work with. |
| 11% | 0% | 7% | b. | it helped me relate information about myself to occupations. |
| 21% | 14% | 17% | c. | it gave me a lot of information. |
| 5% | 0% | 3% | d. | it was objective: it didn't care about my race or sex or anything. |
| 58% | 43% | 52% | e. | all of the above. |
| 19 | 7 | 29 | -- | Number of students who responded to this question. |

7. The worst thing about DISCOVER was:

| PW | G | B | | |
|---|---|---|---|---|
| 89% | 67% | 76% | a. | the machine was broken too often or too slow. |
| 5% | 17% | 7% | b. | there wasn't enough information that I wanted to know. |
| 5% | 17% | 17% | c. | there was too much content: it took too long to get through; it was confusing. |
| 0% | 0% | 0% | d. | I don't like working with a machine; it is too impersonal. |
| 0% | 0% | 0% | e. | all of the above. |
| 19 | 6 | 29 | -- | Number of students who responded to this question. |

8. Using DISCOVER caused me to:

| PW | G | B | | |
|---|---|---|---|---|
| 22% | 57% | 29% | a. | do some reading about occupations and/or educational opportunities. |
| 0% | 14% | 4% | b. | talk to my counselor. |
| 17% | 0% | 18% | c. | talk to my parent(s). |
| 17% | 14% | 14% | d. | talk to people in an occupation or in a particular school. |
| 44% | 14% | 36% | e. | more than one of the above. |
| 18 | 7 | 28 | -- | Number of students who responded to this question. |

9. The information about occupations which I read in DISCOVER:

| PW | G | B | |
|---|---|---|---|
| 22% | 29% | 21% | a. told me everything that I wanted to know about my occupation(s). |
| 67% | 57% | 64% | b. told me most of what I wanted to know. |
| 6% | 0% | 7% | c. was inadequate. |
| 6% | 14% | 7% | d. told me more than I wanted to know. |
| 18 | 7 | 29 | -- Number of students who responded to this question. |

10. In using DISCOVER:

| PW | G | B | |
|---|---|---|---|
| 58% | 43% | 59% | a. I had no difficulty with words or ideas. |
| 32% | 29% | 28% | b. I had no difficulty with words, but some difficulty with ideas. |
| 5% | 14% | 7% | c. I had difficulty with both words and ideas. |
| 5% | 14% | 7% | d. I had no difficulty with ideas, but some difficulty with words. |
| 19 | 7 | 29 | -- Number of students who responded to this question. |

11. The most helpful modules of DISCOVER were: (Mark as many as you wish.)

| PW | G | B | |
|---|---|---|---|
| 25% | 50% | 29% | a. Understanding My Values. |
| 0% | 0% | 0% | b. Learning How to Make Decisions. |
| 13% | 50% | 21% | c. Practicing Career Decisions (the tree). |
| 25% | 0% | 14% | d. Learning How Occupations Can be Grouped. |
| 0% | 0% | 0% | e. Browsing Occupations. |
| 0% | 0% | 0% | f. Reviewing My Interests and Strengths (the Self-Directed Search). |
| 13% | 0% | 7% | g. Making a List of Occupations to Explore. |
| 25% | 0% | 21% | h. Getting Information about Occupations. |
| 0% | 0% | 0% | i. Narrowing My List of Occupations. |
| 0% | 0% | 7% | j. Exploring Specific Career Plans (includes four-year and two-year college information and search; technical schools, apprenticeships, military, continuing educatio financial aids). |
| 8* | 4* | 14* | * Number of students who responded to this question. |

12. The least helpful modules of DISCOVER were: (Mark as many as you wish.)

| PW | G | B | |
|---|---|---|---|
| 22% | 40% | 25% | a. Understanding My Values. |
| 11% | 20% | 13% | b. Learning How to Make Decisions. |
| 33% | 0% | 25% | c. Practicing Career Decisions (the tree). |
| 22% | 0% | 13% | d. Learning How Occupations Can be Grouped. |
| 11% | 20% | 19% | e. Browsing Occupations. |
| 0% | 0% | 0% | f. Reviewing My Interests and Strengths (the Self-Directed Search). |
| 0% | 0% | 0% | g. Making a List of Occupations to Explore. |
| 0% | 0% | 0% | h. Getting Information about Occupations. |
| 0% | 20% | 6% | i. Narrowing My List of Occupations. |
| 0% | 0% | 0% | j. Exploring Specific Career Plans (includes four-year and two-year college information and search; technical schools, apprenticeships, military, continuing educati financial aids). |
| 9* | 5* | 16* | |

* Number of students who responded to this question.

13. DISCOVER could be improved if: (Mark as many as you wish.

| PW | G | B | |
|---|---|---|---|
| 6% | 0% | 8% | a. It were made a lot shorter. |
| 44% | 67% | 44% | b. The machine would move a lot faster. |
| 0% | 33% | 8% | c. The directions were simpler. |
| 13% | 0% | 8% | d. Fewer examples were given. |
| 0% | 0% | 4% | e. It had more information about me in it. |
| 0% | 0% | 0% | f. It were easier to read. |
| 6% | 0% | 4% | g. If it had more or better information about occupations |
| 6% | 0% | 8% | h. There were some plan to allow me to discuss what I learn from DISCOVER with my counselor. |
| 6% | 0% | 4% | i. If it had things in it more appropriate for students my age. |
| 19% | 0% | 12% | j. All or most of the above. |
| 16 | 6 | 25 | -- Number of students who responded to this question. |

14. As a result of using DISCOVER, I learned: (Mark as many as you wish.)

| PW | G | B | |
|---|---|---|---|
| 14% | 33% | 17% | a. more about my values. |
| 0% | 0% | 0% | b. more about my interests. |
| 0% | 33% | 17% | c. more about my abilities. |
| 43% | 0% | 25% | d. how to divide occupations into groups or categories. |
| 0% | 0% | 0% | e. how to explore occupations. |
| 0% | 0% | 8% | f. what kind of decision-maker I am. |
| 0% | 0% | 0% | g. how to make planful decisions. |
| 29% | 0% | 17% | h. a lot about occupations. |
| 14% | 0% | 8% | i. how to plan my career. |
| 0% | 33% | 8% | j. what educational plans I need to make. |
| 7 | 3 | 12 | -- Number of students who responded to this question. |

15. Please summarize your overall reaction to DISCOVER by selecting the one response which describes it best:

| PW | G | B | |
|---|---|---|---|
| 11% | 0% | 7% | a. Use of DISCOVER was a waste of time; it didn't help me at all. |
| 39% | 43% | 36% | b. Most of my experience with DISCOVER was useful; I learned some things which helped me to understand myself better and to make good vocational and educational choices. |
| 11% | 29% | 14% | c. All of my experience with DISCOVER was useful; it really helped me to make vocational and educational choices. |
| 39% | 29% | 43% | d. DISCOVER helped me enough that I think that all students should have the same opportunity I did. |
| 18 | 7 | 28 | -- Number of students who responded to this question. |